The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A hydrogen analyzer comprising in gaseous communication:

a mass transfer unit, having a liquid portion and a gaseous portion, through which hydrogen gas is transferred from a liquid analyte to a carrier gas;

a gas equilibrium reservoir within which hydrogen gas transferred from the analyte is equilibrated;

an oxygen unit for removal of oxygen from the carrier gas containing hydrogen;

a hydrogen sensor for measuring the amount of hydrogen in the carrier gas from which oxygen has been removed; and

a pump for moving the carrier gas through the mass transfer unit, gas equilibrium reservoir, oxygen unit and hydrogen sensor, all of which are connected in fluid flow communication.

2. The hydrogen analyzer of Claim 1, further comprising a carbon monoxide unit for removal of carbon monoxide from the carrier gas containing hydrogen.

3. The hydrogen analyzer of Claim 2, further comprising a sulfur unit for removing sulfur compounds from the carrier gas containing hydrogen.

4. The hydrogen analyzer of Claim 3, wherein the sulfur and carbon monoxide removal units comprise a unit including a composition that is capable of removing both carbon monoxide and sulfur compounds from the carrier gas.

5. The hydrogen analyzer of Claim 4, wherein the gas equilibrium reservoir is defined by the sulfur and carbon monoxide removal unit.

6. The hydrogen analyzer of Claim 4, wherein the carbon monoxide and sulfur compound removal composition is catalyst R3-11.

7. The hydrogen analyzer of Claim 6, further comprising a heater coupled to heat the carrier gas containing hydrogen to a temperature of 55° C to 80°C as the carrier gas flows through the carbon monoxide unit.

8. The hydrogen analyzer of Claim 2, further comprising a heater coupled to heat the carrier gas containing hydrogen as the carrier gas flows through the carbon monoxide unit.

9. The hydrogen analyzer of Claim 1, further comprising a sulfur unit for removing sulfur compounds from the carrier gas containing hydrogen.

10. The hydrogen analyzer of Claim 1, wherein treatment of the carrier gas containing hydrogen neither produces nor consumes hydrogen.

11. The hydrogen analyzer of Claim 1, further comprising a moisture removal unit for removing moisture from the carrier gas.

12. The hydrogen analyzer of Claim 11, wherein the moisture removal unit further comprises a moisture-removal composition selected from the group consisting of molecular sieves and a calcium sulfate preparation.

13. The hydrogen analyzer of Claim 1, wherein the mass transfer unit is selected from the group consisting of a hollow fiber gas transfer module and a sparger.

14. The hydrogen analyzer of Claim 1, wherein the oxygen removal unit comprises an oxygen removal composition.

15. The oxygen removal component of Claim 14, wherein the oxygen removal unit is an ascorbic acid derivative.

16. The hydrogen analyzer of Claim 1, wherein the hydrogen sensor is selected from the group consisting of a Schottky diode and a field effect transistor.

17. The hydrogen analyzer of Claim 1, wherein the hydrogen sensor comprises a metal oxide semiconductor.

18. The hydrogen analyzer of Claim 1, wherein the hydrogen sensor is capable of detecting hydrogen dissolved in an aqueous medium at a concentration of on the order of 0.1 nM.

19. A hydrogen analyzer comprising in gaseous communication:

a mass transfer unit, having a liquid portion and a gaseous portion, through which hydrogen gas is transferred from a liquid analyte to a carrier gas;

a gas equilibrium reservoir within which hydrogen gas transferred from the analyte is equilibrated;

a carbon monoxide unit for removal of carbon monoxide from the carrier gas containing hydrogen;

an oxygen unit for removal of oxygen from the carrier gas containing hydrogen;

a sulfur unit for removing sulfur compounds from the carrier gas containing hydrogen;

a moisture unit for removing moisture from the carrier gas;

a hydrogen sensor for measuring the amount of hydrogen in the carrier gas from which carbon monoxide, oxygen, sulfur compounds and moisture have been removed; and

a pump for moving the carrier gas through the mass transfer unit, gas equilibrium reservoir, carbon monoxide, oxygen, sulfur and moisture units and hydrogen sensor, all of which are connected in fluid flow communication.

20. A process for measuring the amount of dissolved hydrogen in a solution comprising the steps of:

(a) equilibration of liquid containing dissolved hydrogen with a carrier gas;

(b) removal of oxygen from the carrier gas containing hydrogen; and

(c) measuring the amount of hydrogen in the carrier gas that has been treated to remove oxygen.

21. The process of Claim 20, wherein said removal step neither consumes nor produces hydrogen.

22. The process of Claim 20, wherein step (6) further comprises removal of carbon monoxide from the carrier gas continuing hydrogen.

23. The process of Claim 20, wherein step (b) further comprises removal of sulfur compounds from the carrier gas containing hydrogen.

24. The process of Claim 20, wherein step (b) further comprises removal of moisture from the carrier gas containing hydrogen.

25. The process of Claim 20, wherein a metal oxide semiconductor is used to measure the concentration of hydrogen.

26. The process of Claim 25 wherein hydrogen concentration is measured by monitoring an output voltage from the metal oxide semiconductor and calculating the rate of voltage increase.

27. The process of Claim 20, wherein step (b) further comprises the removal of carbon monoxide at a temperature of 55C° to 80°C.

28. The process of Claim 20, wherein in step (a) the liquid containing dissolved hydrogen is an aqueous sample of contaminated groundwater, further comprising a step (d) of determining the status of bioremediation using the hydrogen content measured in step (c).

29. The process of Claim 28, wherein step (d) comprises monitoring hydrogen content to determine the status of natural attenuation of contaminants.